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RADIO TEST REPORT

Report ID:
REP111953

Project number:
PRJ0086107

Type of assessment:
Final product testing

Applicant:
Qolsys Inc.

Product name (type):
Wireless Glass Break Detector IQGB

Model:
IQGlass-S

FCC identifier:
FCC ID: 2AAJXIQGLASSS

ISED certification number:
IC: 11205A-IQGLASSS

Specifications:

- FCC 47 CFR Part 15, Subpart C, §15.231
- RSS-210 Annex A.1, Issue 11, June 2024

Date of issue: September 18, 2025

Alvin Liu, EMC/RF Specialist
Tested by


Signature

David Duchesne, EMC/RF Lab Manager
Reviewed by


Signature

Lab locations

Company name	Nemko Canada Inc.
Facilities	**Ottawa site:** 303 River Road, Ottawa, ON, Canada, K1V 1H2 Tel: +1 613 737 9680 Test site registration number: CA2040 **Montréal site:** 292 Labrosse Avenue, Pointe-Claire, QC, Canada, H9R 5L8 Tel: +1 514 694 2684 Test site registration number: CA2041 **Cambridge site:** 1-130 Saltsman Drive, Cambridge, ON, Canada, N3E 0B2 Tel: +1 519 650 4811 Test site registration number: CA0101
Website	www.nemko.com

Limits of responsibility

Note that this report's results relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of this report.
This test report has been completed following the requirements of ISO/IEC 17025. All results contained in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

Copyright notification

Table of contents

Section 1. Report summary

1.1 Test specifications

FCC 47 CFR Part 15, Subpart C, Clause 15.231	Periodic operation in the band 40.66–40.70 MHz and above 70 MHz
RSS-210 Annex A.1, Issue 11, June 2024	Licence-Exempt Radio Apparatus: Category I Equipment. Momentarily operated devices

1.2 Test methods

ANSI C63.10-2020	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
RSS-Gen, Issue 5, February 2021	General Requirements for Compliance of Radio Apparatus

1.3 Exclusions

None

1.4 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was performed against all relevant requirements of the test standard except as noted in section 1.3 above. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.
Determining compliance is based on the results of the compliance measurement, not taking into account measurement uncertainty, in accordance with section 1.4 of ANSI C63.10-2020.

See "Summary of test results" for full details.

1.5 Test report revision history

Table 1.5-1: *Test report revision history*

Revision #	Date of issue	Details of changes made to test report
REP111953	September 18, 2025	Original report issued

Section 2. Engineering considerations

2.1 Modifications incorporated in the EUT for compliance

There were no modifications performed to the EUT during this assessment.

2.2 Technical judgment

None

2.3 Model variant declaration

There were no model variants declared by the applicant.

2.4 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 3. Test conditions

3.1 Atmospheric conditions

Temperature	15 °C – 35 °C
Relative humidity	20 % – 75 %
Air pressure	86 kPa (860 mbar) – 106 kPa (1060 mbar)

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

3.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

Section 4. Information provided by the applicant

4.1 Disclaimer

This section contains information provided by the applicant and has been utilized to support the test plan. Inaccurate information provided by the applicant can affect the validity of the results contained within this test report. Nemko accepts no responsibility for the information contained within this section and the impact it may have on the test plan and resulting measurements.

4.2 Applicant/Manufacturer

Name	Qolsys Inc.
Address	1919 S Bascom Ave., Campbell, CA 95008, USA

4.3 EUT information

Product name	Wireless Glass Break Detector IQGB
Model	IQGlass-S
Part number	90-210918
Serial number	2923401356, 3025444421
Power supply requirements	Battery: 3 V(DC)
Product description and theory of operation	The IQGlass-S is a wireless glass break detector that is used in conjunction with a compatible Qolsys wireless alarm system that is populated with an SRF319 radio card. It operates at 319.5 MHz. It detects a glass break by the sound produced and it sends an alarm event to the compatible panel using the integrated transmitter. It sends periodic supervision every 60min.
Hardware revision	E-210917 Rev. 00
Software details	JS-704370 Rev 1.05

4.4 Radio technical information

Operation type	Periodic
Frequency band	319.5 MHz
Number of channels	1
Field strength, dBµV/m @ 3 m	Peak 94.1, Average 74.5
Measured BW (kHz), 99% OBW	791
Type of modulation	OOK
Transmitter spurious, dBµV/m @ 3 m	Peak 67.0, Average 47.4 @ 2236.180 MHz
Antenna information	One antenna, helical type soldered to PCB assembly of the transmitter, gain is -14 dBi

4.5 EUT setup details

4.5.1 Radio exercise details

Operating conditions	EUT was powered and worked in the designated operating mode.
Transmitter state	Continually transmitting mode

Section 5. Summary of test results

5.1 Testing period

Test start date	August 22, 2025	Test end date	September 15, 2025

5.2 Sample information

Receipt date	August 22, 2025	Nemko sample ID number(s)	PRJ00861070002, PRJ00861070005

5.3 FCC test results

Table 5.3-1: *FCC Part 15 Subpart C general requirements results*

Part	Test description	Verdict
§15.31(e)	Variation of power source	Pass
§15.31(m)	Number of tested frequencies	Pass
§15.203	Antenna requirement	Pass
§15.207(a)	Conducted limits	Not applicable

Notes: EUT is a battery operated device, the testing was performed using fresh batteries.

Table 5.3-2: *FCC 15.231 requirements results*

Part	Test description	Verdict
§15.231(a)	Conditions for intentional radiators to comply with periodic operation	Pass
§15.231(b)	Field strength of emissions	Pass
§15.231(c)	Emission bandwidth	Pass

5.4 ISED test results

Table 5.4-1: *RSS-Gen Issue 5 requirements results*

Section	Test description	Verdict
7.3	Receiver radiated emission limits	Not applicable[1]
7.4	Receiver conducted emission limits	Not applicable[1]
6.9	Operating bands and selection of test frequencies	Pass
8.8	AC power-line conducted emissions limits	Not applicable[2]

Notes: [1]According to sections 5.2 and 5.3 of RSS-Gen Issue 5, the EUT does not have a stand-alone receiver neither scanner receiver, therefore exempt from receiver requirements.

[2]EUT is a battery operated device, the testing was performed using fresh batteries.

Table 5.4-2: *RSS-210 Issue 11 requirements results*

Section	Test description	Verdict
A.1.2	Technical requirements	Pass
A.1.3	Field strength limits	Pass
A.1.4	Bandwidth of momentary signals	Pass

Section 6. Test equipment

6.1 Test equipment list

Table 6.1-1: *Equipment list*

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
3 m EMI test chamber	TDK	SAC-3	FA003012	1 year	March 9, 2026
Flush mount turntable	SUNAR	FM2022	FA003006	—	NCR
Controller	SUNAR	SC110V	FA002976	—	NCR
Antenna mast	SUNAR	TLT2	FA003007	—	NCR
Receiver/spectrum analyzer	Rohde & Schwarz	ESR26	FA002969	1 year	May 28, 2026
Bilog antenna (20–3000 MHz)	Sunol	JB3	FA002108	1 year	April 8, 2026
Horn antenna (1–18 GHz)	ETS Lindgren	3117	FA002911	1 year	June 2, 2026
Preamp (1–18 GHz)	ETS Lindgren	124334	FA002956	1 year	April 11, 2026
50 Ω coax cable	Huber + Suhner	None	FA003402	1 year	August 6, 2026
50 Ω coax cable	Rohde & Schwarz	None	FA003074	1 year	August 6, 2026
50 Ω SMA coax cable	Huber + Suhner	None	FA003056	1 year	August 6, 2026

Note: NCR - no calibration required

All equipment related to the contribution of measurement has been included in this list. Such items include, but are not limited to, cables, attenuators, directional couplers, and pre-amps.

Table 6.1-2: *Automation software details*

Test description	Manufacturer of Software	Details
Radiated spurious emissions	Rohde & Schwarz	EMC32, Software for EMC Measurements, Version 10.60.00

Table 6.1-3: *Measurement uncertainty calculations based on equipment list*

Measurement	Measurement uncertainty, ±dB
Radiated spurious emissions (30 MHz to 1 GHz)	4.27
Radiated spurious emissions (1 GHz to 6 GHz)	4.74
Signal path calibration (Insertion loss)	0.07
Occupied bandwidth	2.43 %

Notes: UKAS Lab 34, TIA-603 and ETSI TR 100 028-1&2 have been used as guidance for measurement uncertainty reasonable estimations with regards to previous experience and validation of data. Nemko Canada Inc. follows these test methods in order to satisfy ISO/IEC 17025 requirements for estimation of uncertainty of measurement for wireless products. Measurement uncertainty calculations assume a coverage factor of K = 2 with 95% certainty.

Section 7. Testing data

7.1 FCC 15.31(e) Variation of power source

7.1.1 References, definitions and limits

For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

7.1.2 Test summary

Verdict	Pass		
Test date	August 22, 2025	Temperature	24 °C
Tested by	Alvin Liu	Air pressure	980 mbar
Test location	Cambridge	Relative humidity	46 %

7.1.3 Observations, settings and special notes

None

7.1.4 Test data

EUT Power requirements:	☐ AC	☐ DC	☒ Battery
If EUT is an AC or a DC powered, was the noticeable output power variation observed?	☐ YES	☐ NO	☒ N/A
If EUT is battery operated, was the testing performed using fresh batteries?	☒ YES	☐ NO	☐ N/A
If EUT is rechargeable battery operated, was the testing performed using fully charged batteries?	☐ YES	☐ NO	☒ N/A

7.2 FCC 15.31(m) and RSS-Gen, Clause 6.9 Number of frequencies

7.2.1 References, definitions and limits

FCC §15.31(m):
Measurements on intentional radiators or receivers shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table.

RSS-Gen, Clause 6.9:
Except where otherwise specified, measurements shall be performed for each frequency band of operation for which the radio apparatus is to be certified, with the device operating at the frequencies in each band of operation shown in table below. The frequencies selected for measurements shall be reported in the test report.

Table 7.2-1: *Frequency Range of Operation*

Frequency range over which the device operates (in each band)	Number of test frequencies required	Location of measurement frequency inside the operating frequency range
1 MHz or less	1	Center (middle of the band)
1–10 MHz	2	1 near high end, 1 near low end
Greater than 10 MHz	3	1 near high end, 1 near center and 1 near low end

Notes: "near" means as close as possible to or at the centre / low end / high end of the frequency range over which the device operates.

7.2.2 Test summary

Verdict	Pass		
Test date	August 22, 2025	Temperature	24 °C
Tested by	Alvin Liu	Air pressure	980 mbar
Test location	Cambridge	Relative humidity	46 %

7.2.3 Observations, settings and special notes

None

7.2.4 Test data

EUT has only one channel of operation at the frequency of 319.5 MHz

7.3 FCC 15.203 and RSS-Gen, Clause 6.8 Antenna requirement

7.3.1 References, definitions and limits

FCC §15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

RSS-Gen, Clause 6.8:

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report.

7.3.2 Test summary

Verdict	Pass		
Test date	August 22, 2025	Temperature	24 °C
Tested by	Alvin Liu	Air pressure	980 mbar
Test location	Cambridge	Relative humidity	46 %

7.3.3 Observations, settings and special notes

The EUT utilizes a PCB trace antenna, which is an internal, non-detachable antenna design.

7.3.4 Test data

Must the EUT be professionally installed?	☐ YES	☒ NO	
Does the EUT have detachable antenna(s)?	☐ YES	☒ NO	
If detachable, is the antenna connector(s) non-standard?	☐ YES	☐ NO	☒ N/A

Table 7.3-1: *Antenna information*

Antenna type	Manufacturer	Model number	Maximum gain	Connector type
helical antenna	Ocean Spring	20-9154-10005C	−14 dBi	PCB soldered

7.4 FCC 15.231(a) and RSS-210 A.1.2 Technical requirements

7.4.1 References, definitions and limits

FCC §15.231:

(a) The provisions of this section are restricted to periodic operation within the band 40.66–40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal. The following conditions shall be met to comply with the provisions for this periodic operation:

(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

(3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

(4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety-of-life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

(5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

RSS-210 A.1.2:

Devices shall comply with the following for momentary operation:

(a) A manually operated transmitter shall be equipped with a push-to-operate switch and be under manual control at all times during transmission. When released, the transmitter shall cease transmission within no more than 5 seconds of being released.

(b) A transmitter that has been activated automatically shall cease transmission within 5 seconds of activation.

(c) Periodic transmissions at regular, predetermined intervals are not permitted, except as specified in Section A.1.5. However, polling or supervision transmissions that determine system integrity of transmitters used in security or safety applications are permitted, provided the total duration of transmission does not exceed 2 seconds per hour for each transmitter.

(d) Intentional radiators used for radio control during emergencies involving fire, security of goods (e.g. burglar alarms), and safety-of-life, when activated to signal an alarm, may operate during the interval of the alarm condition.

7.4.2 Test summary

Verdict	Pass		
Test date	September 15, 2025	Temperature	24 °C
Tested by	Alvin Liu	Air pressure	990 mbar
Test location	Cambridge	Relative humidity	45 %

7.4.3 Observations, settings and special notes

None

7.4.4 Test data

☐ The EUT is a manually triggered transmitter
☒ The EUT is an automatically triggered transmitter

☒ The EUT is a periodic transmitter (only polling or supervision transmissions)

☐ The EUT usage is for radio control purposes during emergencies
☒ The EUT usage is not for radio control purposes during emergencies

☐ The EUT transmits set-up information
☒ The EUT does not transmit set-up information

Table 7.4-1: *Transmission duration after activation results*

Duration of transmission after activation (s)	Limit of duration of transmission after activation (s)	Margin (s)
1.9	5.0	3.1

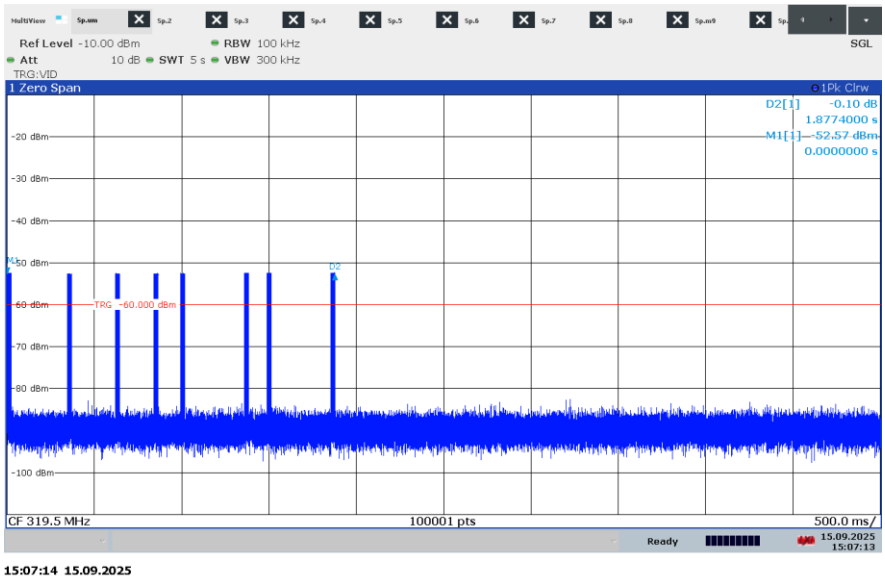


Figure 7.4-1: *Transmission duration after activation (within 5 seconds)*

Test data, continued

Table 7.4-2: *Polling and supervision transmission(s) time per hour results*

Number of transmission(s) per hour	Total duration of transmission (s)	Maximum allowable transmission time (s)	Margin (s)
1	1.9	2.0	0.1

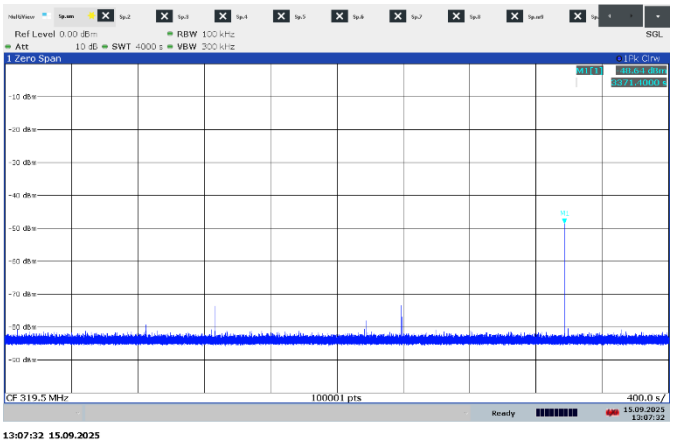


Figure 7.4-2: *Polling and supervision transmissions per hour*

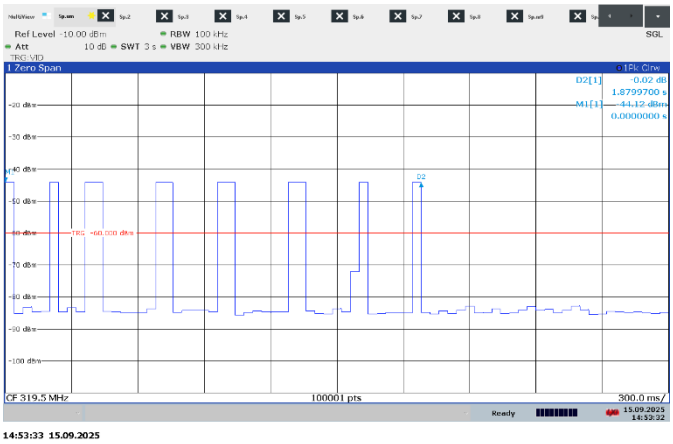


Figure 7.4-3: *Polling and supervision transmission duration*

7.5 FCC 15.231(b) and RSS-210 A.1.3 Field strength of emissions

7.5.1 References, definitions and limits

FCC §15.231:

(b) In addition to the provisions of §15.205 the field strength of emissions from intentional radiators operated under this section shall not exceed the following table.

1) The field strength limits in the table below are specified at a distance of 3 meters. The tighter limits apply at the band edges.
2) Intentional radiators operating under the provisions of this section shall demonstrate compliance with the limits on the field strength of emissions, as shown in the above table, based on the average value of the measured emissions. As an alternative, compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector. The specific method of measurement employed shall be specified in the application for equipment authorization. If average emission measurements are employed, the provisions in §15.35 for averaging pulsed emissions and for limiting peak emissions apply. Further, compliance with the provisions of §15.205 shall be demonstrated using the measurement instrumentation specified in that section.
3) The limits on the field strength of the spurious emissions in the table below are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in §15.209, whichever limit permits a higher field strength.

RSS-210 A.1.3:

a. The field strength of emissions from momentarily operated intentional radiators shall not exceed the limits in table below, based on the average value of the measured emissions. The requirements of the "Pulsed operation" section of RSS-Gen apply for averaging pulsed emissions and limiting peak emissions.
Alternatively, compliance with the limits in the table below may be demonstrated using an International Special Committee on Radio Interference (CISPR) quasi‑peak detector.
b. Unwanted emissions shall be 10 times below the fundamental emissions field strength limits in the table below or comply with the limits specified in RSS-Gen, whichever is less stringent.

Table 7.5-1: *Field strength limits*

Fundamental frequency, MHz	Field strength of fundamental,		Field strength of spurious emissions,	
	µV/m	dBµV/m	µV/m	dBµV/m
40.66–40.70[1]	2,250	67.0	225	47.0
70–130	1,250	61.9	125	41.9
130–174	1,250 to 3,750*	61.9 to 71.5*	125 to 375*	41.9 to 51.5*
174–260[2]	3,750	71.5	375	51.5
260–470[2]	3,750 to 12,500*	71.5 to 81.9*	375 to 1,250*	51.5 to 61.9*
Above 470	12,500	81.9	1,250	61.9

** Linear interpolation with frequency F in MHz:*
For 130–174 MHz: Field Strength (µV/m) = (56.82 × F) − 6136
For 260–470 MHz: Field Strength (µV/m) = (41.67 × F) − 7083

Notes: *[1]The levels applicable to FCC only.*
[2]Frequency bands 225–328.6 MHz and 335.4–399.9 MHz are designated for the exclusive use of the Government of Canada. Manufacturers should be aware of possible harmful interference and degradation of their licence-exempt radio equipment in these frequency bands.

References, definitions and limits, continued

Table 7.5-2: *FCC §15.209 and RSS-Gen – Radiated emission limits*

Frequency, MHz	Field strength of emissions		Measurement distance, m
	µV/m	dBµV/m	
0.009–0.490	2400/F	$67.6 - 20 \times \log_{10}(F)$	300
0.490–1.705	24000/F	$87.6 - 20 \times \log_{10}(F)$	30
1.705–30.0	30	29.5	30
30–88	100	40.0	3
88–216	150	43.5	3
216–960	200	46.0	3
above 960	500	54.0	3

Notes: In the emission table above, the tighter limit applies at the band edges.
For frequencies above 1 GHz the limit on peak RF emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test

Table 7.5-3: *ISED restricted frequency bands*

MHz	MHz	MHz	GHz
0.090–0.110	12.57675–12.57725	399.9–410	7.25–7.75
0.495–0.505	13.36–13.41	608–614	8.025–8.5
2.1735–2.1905	16.42–16.423	960–1427	9.0–9.2
3.020–3.026	16.69475–16.69525	1435–1626.5	9.3–9.5
4.125–4.128	16.80425–16.80475	1645.5–1646.5	10.6–12.7
4.17725–4.17775	25.5–25.67	1660–1710	13.25–13.4
4.20725–4.20775	37.5–38.25	1718.8–1722.2	14.47–14.5
5.677–5.683	73–74.6	2200–2300	15.35–16.2
6.215–6.218	74.8–75.2	2310–2390	17.7–21.4
6.26775–6.26825	108–138	2483.5–2500	22.01–23.12
6.31175–6.31225	149.9–150.05	2655–2900	23.6–24.0
8.291–8.294	156.52475–156.52525	3260–3267	31.2–31.8
8.362–8.366	156.7–156.9	3332–3339	36.43–36.5
8.37625–8.38675	162.0125–167.17	3345.8–3358	Above 38.6
8.41425–8.41475	167.72–173.2	3500–4400	
12.29–12.293	240–285	4500–5150	
12.51975–12.52025	322–335.4	5350–5460	

Note: Certain frequency bands listed in this table and above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

Table 7.5-4: *FCC restricted frequency bands*

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	Above 38.6
13.36–13.41			

7.5.2 Test summary

Verdict	Pass		
Test date	August 22, 2025	Temperature	24 °C
Tested by	Alvin Liu	Air pressure	980 mbar
Test location	Cambridge	Relative humidity	46 %

7.5.3 Observations, settings and special notes

- The spectrum was searched from 30 MHz to the 10th harmonic.
- Radiated measurements were performed at a distance of 3 m.
- Average radiated emissions were obtained by subtracting duty cycle correction factor (DCCF) from the peak measurement results.
- For Tx frequency 319.5 MHz:
  Fundamental average limit (dBµV/m) = 20 × Log_{10}((41.67 × 319.5) – 7083) = 75.9 dBµV/m, and spurious emissions average limit is 55.9 dBµV/m.

Spectrum analyser settings for radiated measurements:

Resolution bandwidth	Measurements below 1 GHz: 100 kHz (Peak) **or** 120 kHz (Q-Peak), Measurements above 1 GHz: 1 MHz
Video bandwidth	Measurements below 1 GHz: 300 kHz, Measurements above 1 GHz: 3 MHz
Detector mode	Peak
Trace mode	Max Hold

7.5.4 Test data

Duty cycle/average correction factor calculations:

§15.35(c) When the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed; the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

$$Duty\ cycle\ or\ average\ factor = 20 \times \log_{10}\left(\frac{Tx_{100_{ms}}}{100_{ms}}\right)$$

As per provided by the applicant,

Period = 100 ms
Pulse width of Type 1 Pulse = 24.53 µs
Pulse width of Type 2 Pulse = 127.3 µs
Pulse width of Type 3 Pulse = 493.7 µs
Number of Type 1 Pulses = 1
Number of Type 2 Pulses = 78
Number of Type 3 Pulses = 1

Calculated Duty cycle correction factor = 20 × $\log_{10}$ [(0.02453 × 1 + 0.1273 × 78 + 0.4937 × 1)/100] = −19.6 dB

Test data, continued

Table 7.5-5: *Radiated field strength of fundamental measurement results*

Frequency, MHz	Measured Peak field strength, dBµV/m	Peak limit, dBµV/m	Peak Margin, dB	Duty cycle factor, dB	Calculated Average field strength, dBµV/m	Average limit, dBµV/m	Average Margin, dB
319.512	94.1	95.9	1.8	−19.6	74.5	75.9	1.4

Notes: The radiated field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.

Table 7.5-6: *Radiated field strength of spurious emissions measurement results – outside restricted bands*

Frequency, MHz	Measured Peak field strength, dBµV/m	Peak limit, dBµV/m	Peak Margin, dB	Duty cycle factor, dB	Calculated Average field strength, dBµV/m	Average limit, dBµV/m	Average Margin, dB
1916.850	66.3	75.9	9.6	−19.6	46.7	55.9	9.2
2555.950	64.8	75.9	11.1	−19.6	45.2	55.9	10.7

Notes:
– The radiated field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.
– The limits on the field strength of the spurious emissions outside restricted bands are based on the fundamental frequency of the intentional radiator.

Table 7.5-7: *Radiated field strength of spurious emissions measurement results – within restricted bands*

Frequency, MHz	Measured Peak field strength, dBµV/m	Peak limit, dBµV/m	Peak Margin, dB	Duty cycle factor, dB	Calculated Average field strength, dBµV/m	Average limit, dBµV/m	Average Margin, dB
1597.520	59.2	74.0	14.8	-19.6	39.6	54.0	14.4
2236.180	67.0	74.0	7	-19.6	47.4	54.0	6.6

Notes:
– The radiated field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.
– The limits on the field strength of the spurious emissions within restricted bands are based on the general limits shown in FCC §15.209 and RSS-Gen.

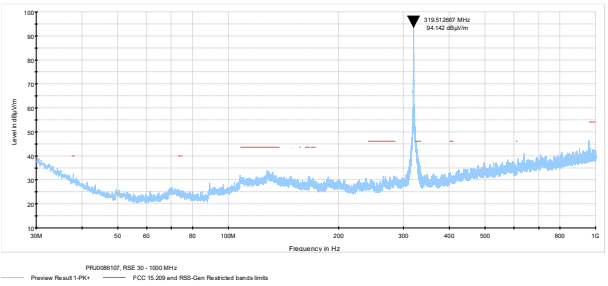


Figure 7.5-1: *Spurious emissions below 1 GHz*

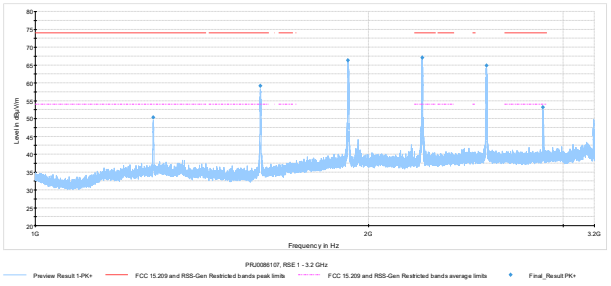


Figure 7.5-2: *Spurious emissions above 1 GHz*

7.6 FCC 15.231(c) and RSS-210 A.1.4 Bandwidth of momentary signals

7.6.1 References, definitions and limits

FCC §15.231(c):
The bandwidth of the emission shall be no wider than 0.25 % of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5 % of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

RSS-210 A.1.4:
The 99% occupied bandwidth of momentarily operated devices shall be less or equal to 0.25% of the centre frequency for devices operating between 70 MHz and 900 MHz. For devices operating above 900 MHz, the 99% occupied bandwidth shall be less or equal to 0.5% of the centre frequency.

7.6.2 Test summary

Verdict	Pass		
Test date	August 22, 2025	Temperature	24 °C
Tested by	Alvin Liu	Air pressure	980 mbar
Test location	Cambridge	Relative humidity	46 %

7.6.3 Observations, settings and special notes

Limit: 0.25 % of 319.5 MHz is 799 kHz

Spectrum analyser settings:

Resolution bandwidth	≥ 1 % of emission bandwidth
Video bandwidth	≥ 3 × RBW
Frequency span	Wider than emission bandwidth
Detector mode	Peak

7.6.4 Test data

Table 7.6-1: *20 dB bandwidth measurement result*

20 dB bandwidth, kHz	Limit, kHz	Margin, kHz
327	799	472

Table 7.6-2: *99% occupied bandwidth measurement result*

99 % occupied bandwidth, kHz	Limit, kHz	Margin, kHz
791	799	8

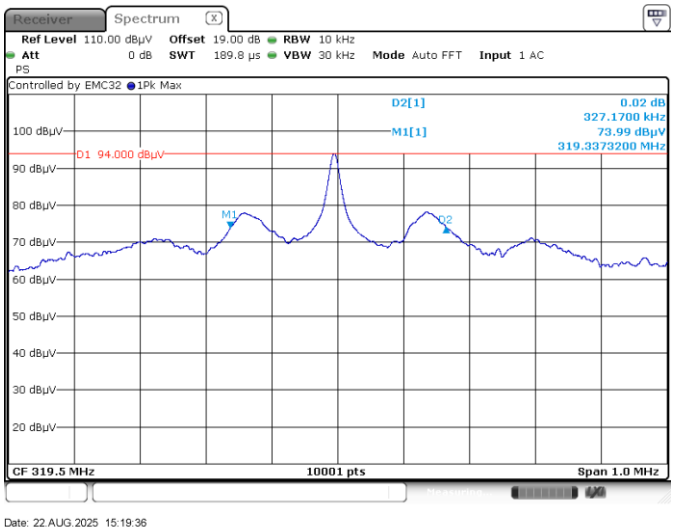


Figure 7.6-1: *20 dB bandwidth*

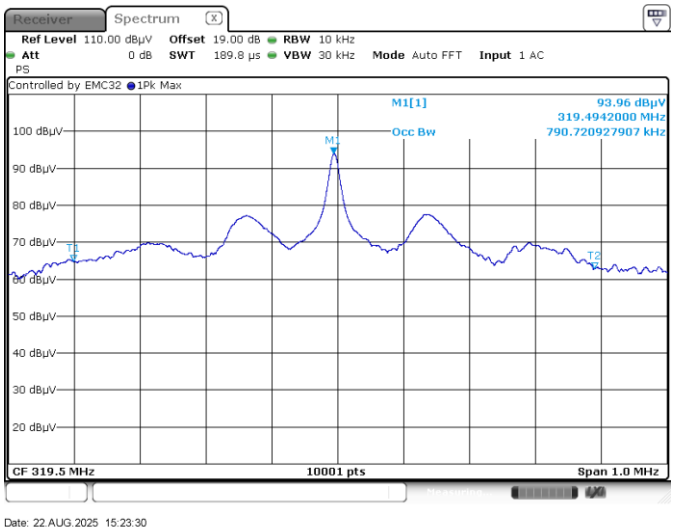
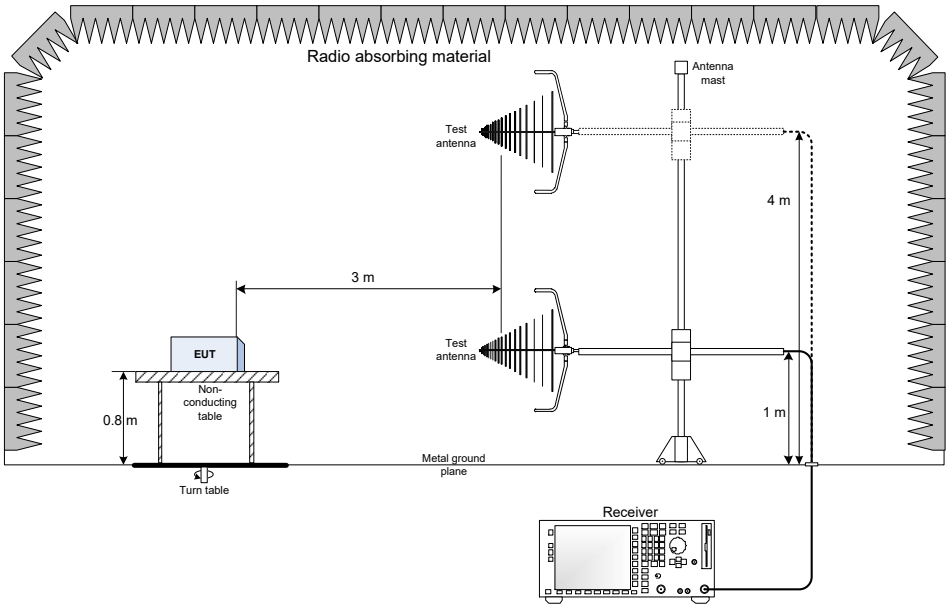


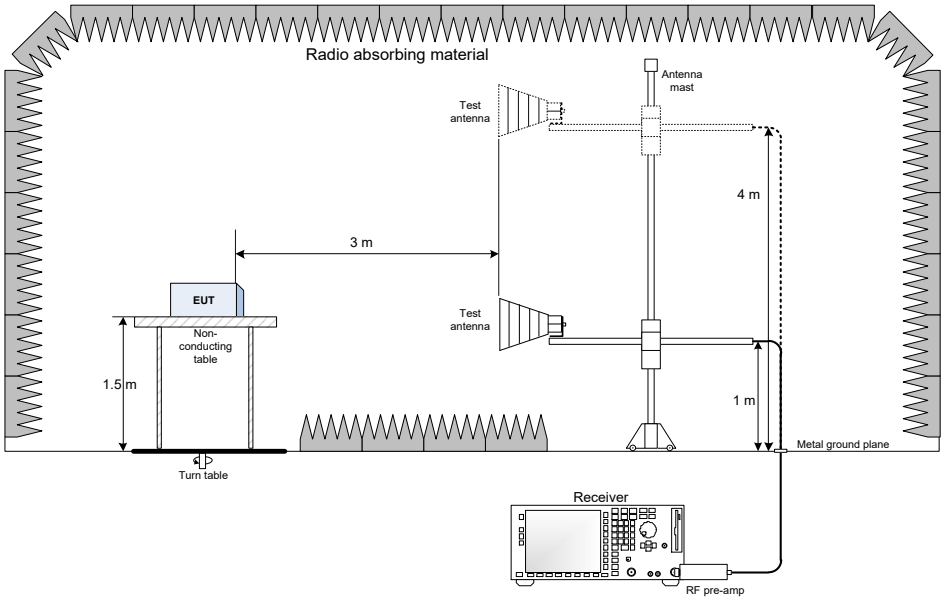
Figure 7.6-2: *99 % occupied bandwidth*

Section 8. Block diagrams of test set-ups

8.1 Radiated emissions set-up for frequencies below 1 GHz



8.2 Radiated emissions set-up for frequencies above 1 GHz



End of the test report